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Latent Feeling and Uncertainty of Perception and Expectations of Price levels over time: A Change Point Analysis

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For the analysis of ordered categorical data, CUB modelling approach entails the estimation of two main structural latent components of the rating process: feeling and uncertainty, parameterized within a two-component mixture of Binomial and uniform distributions: see Piccolo and Simone 2019 for an overview. Featuring parameters can be possibly linked to subject covariates to determine twofold response patterns and they can be promptly estimated using the EM algorithm (as implemented in the R package 'CUB' available on CRAN). The contribution aims at presenting how change point detection of temporal series of estimated feeling and uncertainty can be pursued to identify if and to what extent Italian people modified their perception and judgments of price levels from 1994 to 2019. To this goal, we resort to the framework of Atheoretical Regression Trees (ART, Cappelli et al. 2008) considering the series of monthly response distributions to questions: 1-(Judgments): How do you think the price level changed over the previous 12 months? 2-(Expectations): How do you think the price level will change over the next 12 months? issued by the Italian National Statistical Institute (ISTAT) within the consumers' confidence survey. Responses are collected over a scale with $m=5$ categories (1 =fall', 2 =stay about the same', 3 = rise slightly', 4 =rise moderately', 5 = 'rise a lot'). Preliminary results indicate that ART is effective in partitioning the series into sub-intervals characterized by different levels of the estimated model parameters, allowing to study and compare over time, the change points of both feeling and uncertainty. It's worth noticing that the model parameters refer to two different aspects of the respondents' perception and judgment of price level, thus the study of their change points may reveal that they show different number and location of break dates providing a further and valuable insight into the two components of respondents' answers. Performances of ART are also discussed comparatively with those of other techniques for structural change point detection, in particular with respect to Bai and Perron's procedure as ART mimics this procedure. Keywords: price expectation; price judgment; Atheoretical Regression Trees; CUB model; change point detection

References: C. Cappelli, R. N. Penny, W. S. Rea, M. Reale (2008). Detecting multiple mean breaks at unknown points in official time series, *MATHEMATICS AND COMPUTERS IN SIMULATION*, Volume 78, Issues 2–3, Pages 351-356, ISSN 0378-4754. D. Piccolo, R. Simone (2019). The class of CUB models: statistical foundations, inferential issues and empirical evidence. *STATISTICAL METHOD AND APPLICATIONS*, Volume 28, pages 389-435.

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